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USE OF SELF-REPORT TECHNOLOGY IN THE DEVELOPMENT  
OF AN ORGANIZATIONAL ACTION-RESEARCH PROGRAM

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LEADERSHIP AND MANAGEMENT TECHNICAL AREA

September 1979

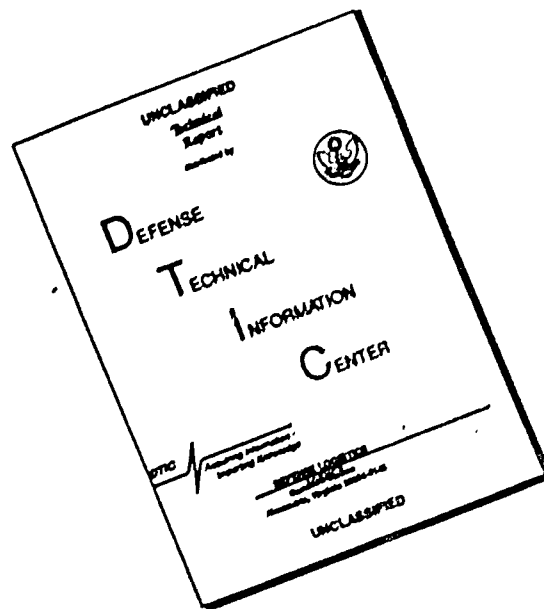


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fell into nine broad categories, of which two--quality of life and supervision--were significantly related to measures of satisfaction and motivation. The supervision factor primarily applied to job-related factors such as effort, while the quality of life factor concerned non-job-related factors such as intention to reenlist.

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# **USE OF SELF-REPORT TECHNOLOGY IN THE DEVELOPMENT OF AN ORGANIZATIONAL ACTION-RESEARCH PROGRAM**

Samuel Shiflett, John R. Turney,  
and Stanley L. Cohen

**LEADERSHIP AND MANAGEMENT TECHNICAL AREA**

U.S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES  
5001 Eisenhower Avenue, Alexandria, Virginia 22333

Office, Deputy Chief of Staff for Personnel  
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**September 1979**

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Organizational  
Effectiveness

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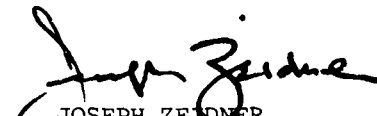
## FOREWORD

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Research in the Leadership and Management Technical Area of the Army Research Institute for the Behavioral and Social Sciences (ARI) has helped provide the foundation for the Army's present programs in organizational effectiveness (OE). ARI Technical Papers 272 and 275 described the development and validation of the Work Environment Questionnaire (WEQ) used to identify and diagnose OE problem areas. This Research Product presents results of early tests of the adaptability of the WEQ by using it in a second Army unit quite different from the support group in which it was first developed.

The Commanding General of the 32d Air Defense Command, MG T. E. Fitzpatrick, Jr., provided the opportunity for data collection, and LTC J. K. Wilson and MAJ J. R. Russel provided critical logistical support in arranging the questionnaire administration. Dr. Lowell Hellevik, Dr. Paul Johnson, Dr. Walter Borman, Andrea Hunt, and Leatta Hough of Personnel Decisions, Inc., suggested specific job satisfaction scales to incorporate into the measurement package and also assisted in the data collection. Finally, Dr. Raymond Kirk and Dr. Russell Leonard made constructive comments on earlier versions of this report.

Technology base research in OE, of which this investigation was a part, is conducted under Army Project 2Q162717A779, Techniques for Organizational Effectiveness and Management Training, FY 1978 Work Program, and 2Q162722A779, FY 1979 Work Program.

  
JOSEPH ZEIDNER  
Technical Director

# USE OF SELF-REPORT TECHNOLOGY IN THE DEVELOPMENT OF AN ORGANIZATIONAL ACTION-RESEARCH PROGRAM

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# USE OF SELF-REPORT TECHNOLOGY IN THE DEVELOPMENT OF AN ORGANIZATIONAL ACTION-RESEARCH PROGRAM

## INTRODUCTION

The mission of the Organizational Effectiveness (OE) Work Unit area of the Army Research Institute (ARI) is the conduct of research which examines the effective utilization of organizational change strategies--such as job enrichment and team development--all of which have the goal of enhancing soldier work motivation, job satisfaction, and job performance. To conduct such research, diagnostic measurement instruments which can accurately identify critical organizational problem areas in specific work settings must be available. These organizational problems must also be potentially amenable to correction through the application of organizational change strategies. Without this preparatory step, any organizational development (OD) implementation effort would not have a proper focus, making it extremely difficult to evaluate the usefulness of the specific OD techniques used.

Numerous OD strategies have emerged over the past decade for application in industrial settings (Friedlander & Brown, 1974). Unfortunately, much less emphasis has been placed on the development of useful measures of organizational variables which could serve as the focus for the application and evaluation of these OD techniques. In fact, OD programs seldom have been directed toward the solution of empirically determined organizational problems. Typically, various strategies are applied to an organization without regard to its actual needs or to the context in which it operates. Therefore, very few research findings exist concerning the actual usefulness of various strategies in reducing specific organizational problems.

To alleviate this problem OE research work units have developed a set of diagnostic instruments for use in the identification of organizational problem areas within specific Army work settings. This particular approach differs in several important ways from previous strategies for the development of such instruments in industrial and other work settings (Bowers, 1973; Hackman & Oldham, 1974). A diagnostic instrument, the Work Environment Questionnaire (WEQ), was designed to fit actual Army settings in communications units. A substantial portion of the WEQ is designed so that reference is made to distinct aspects of the job, specific equipment used by the personnel, and specific positions in the chain of command of the organization under study. Initial results of that research effort, which has extended over a 3-year period, are contained in Turney and Cohen (1976).

Although the questionnaire was designed to make specific reference to distinctive aspects of the organization under study, a second goal in the development of the questionnaire was to provide for its general adaptability to a wide variety of Army work settings. Thus, a number

of items in the original WEQ, which dealt with certain characteristics of the situation and leadership, were of a general enough nature to be applicable to a variety of situations.

A second major Army organization was chosen to cross validate and extend the WEQ. This next step examined the generality and adaptability of the WEQ and the principles upon which it was based (Turney & Cohen, 1976). The new command was substantially larger than the original one developed for the WEQ. This combat arms command contained many units that were widely separated geographically. They served a variety of missions and duties, both support and combat.

This report presents the results of the initial research contact with the new command. This first step of a multistage research project served several purposes. The ARI research team became familiar with the many unique characteristics and problems of the organization and concurrently allowed the host organization to become acquainted with and accustomed to having frequent interaction with civilian behavioral scientists. This pilot survey contained items which were expected to provide information for the development of the formal version of the WEQ for the new command, to be administered approximately 1 year after the pilot survey reported here. Because the WEQ was carefully designed for specific noncombat, communications units, it could not be administered to the presently available population without substantial alteration. However, as mentioned above, some portions of the WEQ were general enough to be meaningfully applied to a large number of situations. Those portions that might be applicable to the new organization were included in the pilot survey questionnaire. This procedure allowed a preliminary examination of the potential applicability of the WEQ into a new setting.

In addition to selected items from the WEQ, a number of items were included which were believed to have a potential impact on soldier perceptions. These items were developed from information obtained in interviews with various staff and command personnel during a previous orientation of ARI researchers to the new command. In addition, a number of satisfaction measures and other potential criterion measures were included as part of the survey instrument. The remainder of this report describes (a) the sampling procedure; (b) a description of the instrument, highlighting the similarities and differences between the present instrument and the WEQ; (c) description of the criterion measures; and (d) preliminary validation results.

#### SAMPLING PROCEDURE

The survey was conducted in selected units of a large combat arms command of the U.S. Army in West Germany. Subjects filled out two questionnaires: one was the pilot diagnostic instrument designed by the ARI research team, and the other was the satisfaction and criterion measure questionnaire. The research design and sampling procedures are

described in this section. The content and psychometric properties of the survey instruments are described in the following two sections.

### Research Design

The survey instruments were administered to 320 enlisted personnel in grades E-1 to E-5. To obtain a representative sample of the entire command, and to assure reasonable variance on items of interest, the survey was conducted in eight company-sized units selected by the command headquarters to fit the research design shown in Figure 1. That is, three units were selected from among those involving major weapons system A, three from among units with major weapons B, one unit involving weapons system C, and one headquarters unit. In addition, as requested by ARI, the headquarters staff selected the six major weapons system units so that one unit from each weapons system had relatively high morale and one had relatively low morale. The remaining four units were selected to be units representative of medium morale. Determinations of unit morale were made by staff members of the command headquarters, using various indicators routinely maintained and believed to be valid indicators of morale by the command. The actual morale category into which each of the units was placed was never divulged to any command personnel other than those involved in the selection, and the ratings were not divulged to the ARI research team until all data had been collected. The confidentiality of those ratings is maintained throughout this report.

### Procedure

Each unit surveyed provided a sample of 40 soldiers for a total sample across eight units of 320 soldiers. To assure a representative picture within each unit, a stratified random sampling procedure was employed. Tactical units contain two tactical platoons and one headquarters/support platoon. Therefore, subjects were selected so that each of the two tactical platoons provided 15 soldiers, and the headquarters/support platoon provided 10 soldiers, for a total of 40 soldiers per platoon.

Random sampling was assured as follows. Upon arrival at a company site, the research team provided an introductory briefing to the company headquarters and then met with the first sergeant to select the sample. A complete unit roster of all personnel below the rank of E-6 was used. The only names not considered for inclusion in the sample were those soldiers who would not be physically present during the 48-hour period that the research team spent at each site. Using a predetermined series of randomly chosen numbers, personnel were selected from the unit roster using the last digit of their social security number until the required sample from each platoon was attained. Questionnaires were administered at various times during the 2-day period to

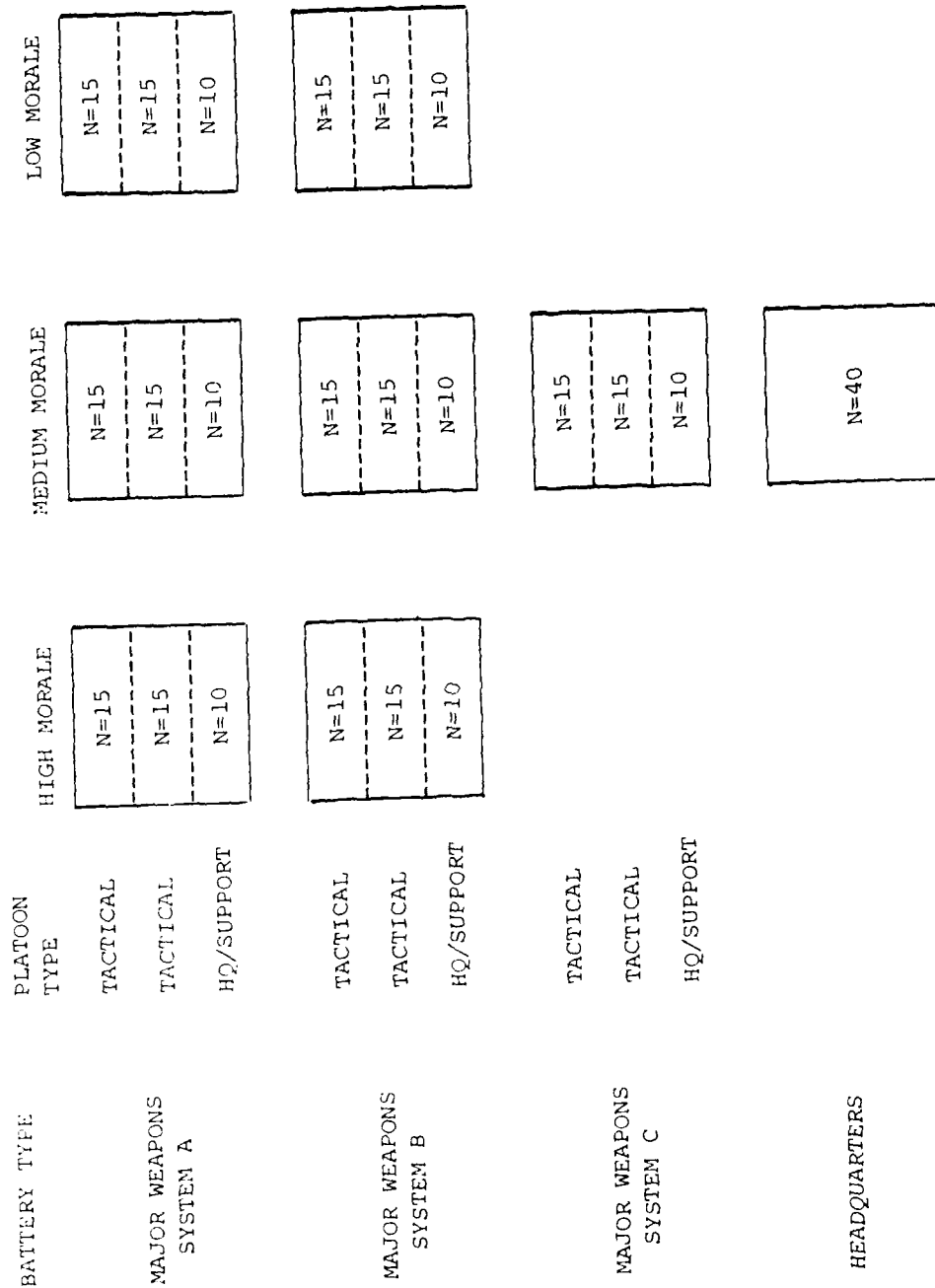


Figure 1. Sampling design.

minimize the impact of removing men from duty and to obtain men who would otherwise have been unavailable for the survey.

#### CHARACTERISTICS OF THE DIAGNOSTIC SURVEY ITEMS

The items in the pilot survey represent a subset of items extracted from the WEQ (Turney & Cohen, 1976) in addition to a small number of items added in an attempt to gain some initial information on problems that might be unique to the new setting. Where possible, the questionnaire was arranged in a manner similar to that of the original WEQ. The description which follows is organized around sections within the questionnaire, which in turn reflects to some extent the organization and content of the portions of the WEQ that were not situation-specific.

##### Perceptions About Certain Aspects of the Job, Supervision, Work Group, and Cultural Environment

The items in this section of the questionnaire reflect the situational variables that intervene between motivation and actual effort exerted and possibly obstruct the desired effort of the worker. They include the work group, task requirements, communication, and supervision. Specific content of the items describes aspects of the work environment that could be addressed by OD intervention strategies if they were identified as problem areas by the data. Of the 29 items in this section, 17 are from the original WEQ and represent a reduction from the original 25 items used there. The remaining items deal primarily with problems of living in Germany, boredom and hostility, the meaningfulness of their mission, and attitudes toward military discipline.

To determine if the underlying factor structure was maintained after reducing the number of items and adding items involving new situations, a factor analysis of these 29 items was performed using a principal axes solution with varimax rotations. The resulting factor structure along with the item loadings are presented in Table 1. An eight-factor structure was selected as most meaningful. In the original WEQ, the 17 items common to both questionnaires had been found to spread themselves across five distinct factors. As shown in Table 1, this is not the case with the present data. The first factor is clearly a general supervision factor and incorporates the "structuring-supervision," the "consideration-supervision," and the "job responsibility" factors of the original WEQ. The remaining common items loaded on factor 5, which represents the collapsing of the "group cohesion" and "group performance" factors onto a single dimension. Item 9, "the most deserving persons are promoted," did not load on either of these factors; instead, it loaded on factor 8 with other new items.

Table 1. Factor Structure of Items Dealing with Attitudes towards Supervision, Work Group, and Environment

Items	Factor Loadings							
	I	II	III	IV	V	VI	VII	VIII
1. My job performance is meaningfully evaluated by my immediate supervisor.	.77	.04	-.14	.08	.00	.05	-.11	-.02
2. My supervisor sets clear goals for me in my present job.	.75	-.06	.02	-.01	.08	.06	-.09	-.17
3. My fellow workers do not encourage superior performance.	.02	.09	-.01	-.01	-.78	.13	.02	-.17
4. My supervisor goes out of his way to help me do an outstanding job.	.77	-.08	-.11	.07	-.06	-.15	-.03	-.09
5. My job makes good use of my abilities.	.67	-.01	.10	.09	.20	-.23	.04	-.16
6. My job duties are clearly defined by my supervisor.	.70	-.11	.05	.01	.18	.06	-.07	-.11
7. My group works well together as a team.	.17	.09	.01	-.17	(.49)	.24	-.33	-.37
8. My job really is as important as it was described to me when I first joined the Army.	.45	.03	.01	.06	.16	-.30	.09	-.44
9. The most deserving persons are promoted.	.25	.00	-.03	.12	.04	-.05	-.02	-.63
10. My supervisor encourages me to help in developing work methods and job procedures.	.75	-.06	.03	-.01	.10	-.09	.01	-.15
11. My supervisor assigns me the tasks that I am best at doing.	.71	-.08	-.10	.19	.03	-.09	.07	-.14
12. If I perform outstandingly in my present job, my supervisor is likely to recommend me for an award for my performance.	.72	.02	-.01	.06	.02	-.25	-.04	-.18
13. Instructions given to me by my supervisor never conflict with information I receive from other sources.	.47	-.08	-.04	.09	.44	-.14	.12	-.09

Table 1. Factor Structure of Items Dealing with Attitudes towards Supervision, Work Group, and Environment (Cont.)

Items	Factor Loadings							
	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>	<u>V</u>	<u>VI</u>	<u>VII</u>	<u>VIII</u>
14. My supervisor has clearly defined areas of responsibility.	<u>71</u>	01	10	-05	12	12	-04	-13
15. My fellow workers emphasize superior performance.	32	01	07	05	<u>62</u>	02	01	-34
16. My supervisor is likely to personally commend us for outstanding performance.	<u>78</u>	-06	06	06	-03	01	-16	-03
17. I do not get along too well on the German economy when I am alone.	-01	02	<u>78</u>	24	04	<u>13</u>	00	-09
18. The fact of the matter is that most of the officers in this command are more interested in their careers than in their men.	-06	21	05	06	00	<u>70</u>	10	09
19. I like the German life style.	03	03	<u>68</u>	26	12	13	-07	-32
20. My unit is in a relatively isolated part of Germany.	02	32	13	16	23	-05	44	11
21. Deep in their hearts, most NCO's want to go back to the old "hard nose" Army.	-12	<u>87</u>	-08	02	-06	11	06	04
22. Deep in their hearts, most officers want to go back to the old "hard nose" Army.	-09	<u>88</u>	05	-03	-05	10	08	05
23. I frequently feel isolated and alone because I can't speak German very well.	08	08	-29	<u>73</u>	03	19	-04	01
24. Filling out questionnaires like this one is a waste of time because nothing ever comes of it.	-12	19	-18	18	08	08	12	<u>61</u>
25. There is a lot of boredom in my units.	-16	03	-21	06	-17	<u>58</u>	46	13
26. There is a lot of hostility and anger in my unit.	-17	05	-08	-09	-10	20	<u>81</u>	-03



Table 1. Factor Structure of Items Dealing with Attitudes towards Supervision, Work Group, and Environment (Cont.)

Items	Factor Loadings							
	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>	<u>V</u>	<u>VI</u>	<u>VII</u>	<u>VIII</u>
27. I would like this assignment better if I could understand the German life style better.	18	-08	14	80	-03	-09	05	-02
28. I believe that my unit's mission is important to the security of the United States.	27	07	-02	22	31	-36	09	-43
29. I have the opportunity on my job to work as hard as I want doing the things that I want.	53	01	14	35	07	-30	08	-11

Factor 2 contains the two items dealing with the "hard-nosed" Army, implying a belief that supervisors would prefer stricter discipline. Interestingly, this tends to be positively related to the extent to which the individual feels isolated in Germany, as indicated by the moderate loading of item 20 on this factor. Factor 3 deals with the extent to which the individual likes living in Germany or likes the German lifestyle. Factor 4 reflects a feeling of isolation, helplessness, and a feeling of inability to function adequately in the German culture. Factor 6 taps boredom, and the item dealing with the attitude of officers toward their men also loads on this factor. Factor 7 is a general isolation-boredom-hostility factor, and factor 8 appears to be tapping a general dimension of alienation, with items dealing with fairness of promotions, importance of job and other time-wasting activities, including filling out this type of questionnaire.

The original WEQ items dealt with on-the-job aspects of group processes and supervision. The addition of the new items may have introduced so much additional variance into the item set that the factor analysis could not adequately separate the original factors, which would be expected to be more intimately related to one another. Therefore, a second factor analysis was performed involving only the original 17. The results of this factor analysis are presented in Table 2. As shown, there was no substantial change from the 29-item factor analysis, and it is clear that the original factor structure collapsed into two factors, one dealing with supervision and one dealing with group processes. Thus, although the reduction in the number of items undoubtedly played a role in the collapsing of the original factor structure, it seems apparent that the respondents in the present sample are essentially using a single, general evaluative dimension of supervision. It is not possible to determine whether the present results are due to an inadequate item set or to a real tendency for our subjects to perceive their leaders in a global, undimensional manner. Therefore, it seems wise to use the complete item set from the original WEQ in developing a final version of the WEQ.

#### Feelings About the Job Itself

This part of the questionnaire continues to focus on the variables intervening between motivation and effort. A different item format is introduced that provides information on whether the respondent feels that each situational intervention is adequate, too much, or too little. The 5 items in this section were extracted from the original set of 10 items reported by Turney and Cohen (1976), again using the factor structure reported there as the basis for selecting items. The present 5 items were factor analyzed, and the results are presented in Table 3. The obtained factor structure is fairly similar to the one originally obtained by Turney and Cohen. The first factor, job autonomy, clearly replicates the original first factor. The second factor, job activity level, also replicates the second factor in the original analysis. The third factor, group performance orientation, is also similar to the

Table 2. Factor Structure for Original 17 Items  
from WEQ General Attitude Section

<u>Items</u>	<u>Factor Loadings</u>	
	<u>I</u>	<u>II</u>
1. My job performance is meaningfully evaluated by my immediate supervisor	<u>76</u>	-06
2. My supervisor sets clear goals for me in my present job.	<u>74</u>	-19
3. My fellow workers do not encourage superior performance.	12	<u>67</u>
4. My supervisor goes out of his way to help me do an outstanding job.	<u>80</u>	-02
5. My job makes good use of my abilities	<u>67</u>	-33
6. My job duties are clearly defined by my supervisor.	<u>66</u>	-28
7. My group works well together as a team.	10	- <u>61</u>
8. My job really is as important as it was described to me when I first joined the Army.	<u>50</u>	-37
9. The most deserving persons are promoted.	35	-30
10. My supervisor encourages me to help in developing work methods and job procedures.	<u>75</u>	-20
11. My supervisor assigns me the tasks that I am best at doing.	<u>75</u>	-12
12. If I perform outstandingly in my present job, my supervisor is likely to recommend me for an award for my performance.	<u>76</u>	-14
13. Instructions given to me by my supervisor never conflict with information I receive from other sources.	44	-46
14. My supervisor has clearly defined areas of responsibility	<u>66</u>	-16
15. My fellow workers emphasize superior performance.	27	- <u>74</u>
16. My supervisor is likely to personally commend me for outstanding performance	<u>78</u>	-02
17. I have the opportunity on my job to work as hard as I want doing the things that I want.	<u>59</u>	-18

originally obtained factor; however, item 3, dealing with interruptions in the daily routine, loads on this factor whereas it did not in the original factor. In fact, in the context of only 5 items, the third item dealing with the number of interruptions is seen as somewhat more ambiguous and loads on both factors 2 and 3.

Table 3  
Factor Structure for Feelings About the Job Itself

Item	Factor loading		
	I	II	III
1. Degree to which it keeps me busy	23	<u>88</u>	-07
2. Opportunity to use own judgment	<u>79</u>	14	16
3. Number of interruptions in daily routine	-35	<u>56</u>	<u>56</u>
4. Extent to which supervisor lets me work the way I want	<u>84</u>	01	07
5. Extent to which work group encourages superior performance	33	-09	<u>83</u>

#### Training

The questions in this section focus on the initial training personnel received to prepare them for performing their jobs. A major concern is the relevance of formal off-the-job training to actual on-the-job performance. The items are designed to cover both off-the-job and on-the-job sources of training for comparative data analyses. Actual training sources must be identified for the specific Army organization under study.

The items of the present questionnaire were taken verbatim from the original WEQ with two exceptions. Item 1 in the original WEQ dealt with the formal training school that virtually all of the respondents attended in preparation to their assignments to the particular organization being studied. Because of the much wider range of occupations represented in the present command, it was not appropriate to name a specific training school. Therefore, the general term AIT (Advanced Individual Training) was substituted to cover all forms of advanced training. Item 4 on the original WEQ, dealing with "sidesaddle on-the-job training," was not

included, since it was not clear that this type of training occurred or that this term would be understood in the new command.

The factor analysis of these items, presented in Table 4, indicates a rather clear distinction between off-the-job training and on-the-job training.

Table 4  
Factor Structure for Attitudes Toward Training

Item	Factor loadings	
	I	II
1. Advanced Individual Training	12	-77
2. Formal Unit-Level Classroom Training	11	-84
3. On-the-Job Training	81	-15
4. Discussions with Supervisor	64	-41
5. Informal Discussions with Fellow Workers	69	00

#### Job Importance

This section of the questionnaire focuses on a worker's beliefs about how important his job really is. The importance the worker attaches to his job can have a strong impact on his motivation to perform at a high level.

This importance is in large part influenced by the worker's interactions with the superiors who structure his job and his Army duties. Items in this section describe various sources of perceived job importance ranging from the individual himself through his supervisor all the way up to command headquarters.

A factor analysis of the five items in this section yielded two factors presented in Table 5. Factor 1 involves job importance to the individual himself and his immediate supervisor. Factor 2 involves job importance to all of the higher headquarters echelons. There was a slight tendency for perceived job importance to the supervisor to load on both factors.

Table 5  
Factor Structure for Perceived Job Importance

Item	Factor loadings	
	I	II
1. Self	15	<u>-91</u>
2. Supervisor	43	<u>-74</u>
3. Company Headquarters	<u>81</u>	-36
4. Battalion Headquarters	<u>92</u>	-23
5. Command Headquarters	<u>89</u>	-21

#### CRITERION DEVELOPMENT

The development of adequate criteria for validating a diagnostic instrument and evaluating the effectiveness of any OD intervention efforts is essential to a well-designed research program. This aspect of OD research programs is often the most difficult, the most time consuming, and unfortunately, usually the most poorly conceived and executed. Its critical role in the research process has made it a prime focus of the present research program. The approach selected for this initial research contact with a new organization was to adopt a broad, exploratory strategy that allows for a very general beginning, followed by severe focusing of efforts and attention as the program approaches the intervention phase. The general plan being followed in eventually selecting criterion measures involved the administration of a very generalized pilot survey instrument, containing a variety of potential evaluative and validation criteria. Those measures are described in this section.

The next step in the overall research program involves placing a scientist directly in the organization to maintain contact on a daily basis for 6 to 9 months to make detailed task and activity analyses, as well as develop and pilot test a final diagnostic instrument (i.e., the WEQ). Finally, just prior to implementing an OD intervention program, a final diagnostic and baseline survey will be obtained. The latter phases of the program will be discussed in subsequent reports.

As a first step in developing an adequate and meaningful set of evaluation and validation criteria, as many different measures as practical were considered at the individual and unit level. Individual

measures of satisfaction and morale were included, as well as self reports of individual effect, motivation, and certain other behaviors. Most of the self-report measures of satisfaction, morale, and motivation were based upon scales and instruments previously developed in industrial or military settings and reported in technical papers or in the open literature. The particular instruments and formats used were chosen after detailed discussions with scientists from Personnel Decisions, Inc. (PDI). Their recommendations were based on recent and extensive pretesting of a wide range of instruments in selected Army settings, as described in detail elsewhere (Borman et al., 1975). Final inclusion of all instruments into the survey involved a number of considerations, including known psychometric properties, length and time constraints, and the possibility that the information might be used both as a criterion and as a piece of diagnostic information.

The remainder of this section describes content, form, and some statistical properties of each of the criterion instruments, as well as the unit level administrative and performance criteria.

#### Job Descriptive Index

The Job Descriptive Index (JDI) (Smith, Kendall, & Hulin, 1969) was administered in its entirety and five scale scores were obtained from each respondent assessing satisfaction with the work, supervision, pay, promotions, and coworkers. The original format and scoring procedures recommended by Smith et al. (1969) were used. One phrase from among the "pay" items was changed from "satisfactory profit sharing" to "satisfactory benefits," since the former concept was inappropriate in a military setting.

Table 6 presents the obtained intercorrelations among the five scales. In the original matrices presented by Smith et al. (1969, pp. 77-78), the  $r$ 's ranged from .28 to .42 for males and from .16 to .52 for females. The present intercorrelations are within the same range. The major difference in the present data appears to exist in the distinct tendency for the coworkers' scale to be less strongly associated with the other four scales.

#### Brayfield-Rothe Index of Job Satisfaction

The complete set of items, answered on 5-point Likert scales, was included. Item 0 is the example item used by Brayfield and Rothe (1951) and is not normally considered to be one of the standard items. The remaining 18 items are typically summed to produce a single index of job satisfaction.

These items were factor analyzed, and the results are presented in Table 7. A two-factor structure emerged as the most interpretable. Item 0, the example item, did not load on either factor. The two factors appear to reflect a very strong response bias, with all the

positively worded items loading on the first factor and most of the negatively worded items loading on the second factor. The only exceptions to this pattern are reflected in items 3 and 10, where each is essentially negative but loads on the positive factor. This can be explained, since examination of the items shows that they use a positive descriptor (i.e., "more interesting"), even though the tone of the item is negative.

Table 6  
Intercorrelation Matrix of JDI Scales

	1	2	3	4	5
1. Work	1.00				
2. Supervision	.56	1.00			
3. Pay	.30	.34	1.00		
4. Promotion	.52	.45	.42	1.00	
5. Coworkers	.31	.27	.20	.20	1.00

Three composites were derived from this set of items: "positive attitude," consisting of items 1, 2, 3, 5, 7, 9, 10, 12, 13, 15, and 17 as listed in Table 7; "negative attitude," consisting of the remaining 7 items; and "overall index of satisfaction," containing all 8 items.

#### Minnesota Satisfaction Questionnaire

The 20-item short form of the Minnesota Satisfaction Questionnaire (MSQ) (Weiss, Dawis, England, & Lofquist, 1967) was used. These items, answered on 5-point Likert scales, were subjected to a factor analysis with varimax rotations. Inspection of several different rotations indicated that the questionnaire is essentially unidimensional and that the first principal axis factor, presented in Table 8, best describes the factor structure. The only item not loading on the factor is number 18, "the way the guys in my unit get along with each other." This is consistent with other findings indicating that satisfaction with coworkers is not strongly related to job satisfaction.

A simple composite containing all 20 items was derived from this item set. In addition, two other composites were derived on the basis of the report by Weiss et al. (1967) suggesting that an intrinsic and



Table 7. Brayfield and Rothe Satisfaction Items

<u>Items</u>	<u>Factor Loadings</u>	
	<u>I</u>	<u>II</u>
0. There are some conditions concerning my job that could be improved.	-28	15
1. My job is like a hobby to me.	<u>68</u>	-24
2. My job is usually interesting enough to keep me from getting bored.	<u>68</u>	-38
3. It seems that my friends are more interested in their jobs.	<u>53</u>	08
4. I consider my job rather unpleasant.	-07	79
5. I enjoy my work more than my leisure time.	<u>61</u>	01
6. I am often bored with my job.	-17	<u>66</u>
7. I feel fairly well satisfied with my present job.	<u>70</u>	-34
8. Most of the time I have to force myself to go to work.	-10	<u>69</u>
9. I am satisfied with my job for the time being.	<u>56</u>	-43
10. I feel that my job is no more interesting than others I could get.	<u>54</u>	28
11. I definitely dislike my work.	-18	<u>79</u>
12. I feel that I am happier in my work than most other people.	<u>62</u>	-39
13. Most days I am enthusiastic about my work.	<u>69</u>	-34
14. Each day of work seems like it will never end.	-11	<u>62</u>
15. I like my job better than the average worker does.	<u>69</u>	-41
16. My job is pretty uninteresting.	-22	<u>64</u>
17. I find real enjoyment in my work.	<u>64</u>	-51
18. I am disappointed that I ever took this job in the Army.	-21	<u>66</u>

Table 8. Factor Structure for Minnesota Satisfaction  
Questionnaire Items

<u>Items</u>	<u>Factor Loadings</u>
1. Being able to keep busy all the time	50
2. The chance to work alone on the job	54
3. The chance to do different things from time to time	69
4. The chance to be somebody in the civilian community	52
5. The way my boss handles his men	64
6. The competence of my superior in making decisions	73
7. Being able to do things that don't go against my conscience	62
8. The way my job provides for steady employment	71
9. The chance to do things for other people	71
10. The chance to tell people what to do	72
11. The chance to do something that makes use of my abilities	76
12. The way the Army's policies are put into practice	53
13. My pay and the amount of work I do	53
14. The chances for advancement on this job	74
15. The freedom to use my own judgment	80
16. The chance to try my own methods of doing the job	82
17. The working conditions	70
18. The way the guys in my unit get along with each other	16
19. The praise I get for doing a good job	65
20. The feeling of accomplishment I get from the job	74

extrinsic factor exists in the item set. The distinction between intrinsic and extrinsic items was not supported by the factor analyses, but the scores were obtained to replicate the original procedures used by Weiss et al. Intrinsic items were 1, 2, 3, 4, 7, 8, 9, 10, 11, 15, 16, and 20 as listed in Table 8.

#### Sears Items

The original 40 items of the Sears questionnaire (Smith, 1962) were reduced to a set of 21 items for administration in the present survey. Decisions for eliminating items were made by PDI, in consultation with the present authors, on the basis of previous administrations on similar populations (Borman et al., 1975). Factor analysis of the 21 items yielded an interpretable four-factor structure presented in Table 9. The four factors were labeled work, pay, supervision, and coworkers. Composite scores were derived for each factor.

#### Survey of Organizations

Through a series of reductions made during the various phases of the project described by PDI (Borman et al., 1975), 17 selected items from five subscales of the Survey of Organizations (SOO) (Taylor & Bowers, 1972) were included in the present survey instrument. Subscales included the seven-item "over-all satisfaction" scale (Borman et al., 1975, p. 76), and the supervisory support, supervisory goal emphasis, peer support, and peer goal emphasis scales (pp. 48-49). The scale point labels for the 7 overall satisfaction items were changed by PDI from those originally used, and several of the 17 items were reworded slightly.

Factor analysis with rotations resulted in an interpretable five-factor structure that clearly identified the five SOO subscales entered into the analysis. That is, there emerged an overall satisfaction factor, supervisory support and goal emphasis factors, and peer support and goal emphasis factors. The only exceptions to the original item placement within subscales occurred in the overall satisfaction subscale, where item 1, dealing with peer group satisfaction, loaded on the peer support factor, and item 2, dealing with satisfaction with supervisor, loaded on the supervisory support factor. This factor structure is presented in Table 10.

Based on this analysis, five composite scores were derived, corresponding to the subscales originally derived by Taylor and Bowers. In addition, a second overall satisfaction composite was derived involving only the five items that actually loaded on the satisfaction factor.

Table 9. Factor Structure for Sears Items

Items	1	2	3	4
1. The people who supervise me have more good traits than bad ones.	-17	-13	73	12
2. The supervision I receive is the kind that encourages me to give extra effort.	24	16	-71	-02
3. How does the way you are treated by those who supervise you influence your overall attitude toward your job?	08	11	-70	-09
4. How much do the efforts of those who supervise you add to the success of your unit?	-29	-08	59	14
5. How do you feel about the supervision you receive?	-30	-13	76	08
6. Do you ever have the feeling you would be better off working under different supervision?	19	19	-71	-01
7. How much of the work you do stirs up real enthusiasm on your part?	-75	-09	01	15
8. How many of the things you do on your job do you enjoy?	-70	-09	29	19
9. How do you feel about the kind of work you do?	71	03	-35	-09
10. How does the kind of work you do influence your overall attitude toward your job?	65	18	-31	00
11. How often when you finish a day's work do you feel you've accomplished something really worthwhile?	-76	-11	19	15
12. Work like mine encourages me to do my best.	74	15	-36	-03
13. How do you generally feel about the soldiers you work with?	10	11	-06	81
14. How is your overall attitude toward your job influenced by the people you work with?	-30	-15	21	50
15. The example my fellow soldiers set encourages me to work hard.	26	15	-21	-53
16. How much does the way co-workers handle their jobs add to the success of your unit?	41	16	-14	-47
17. In this unit there is some friction.	16	26	-31	-11
18. How does the amount of money you now make influence your overall attitude toward your job?	-04	-70	09	00
19. Does the way pay is handled around here make it worthwhile for a person to work especially hard?	-20	-76	07	12
20. To what extent are your needs satisfied by the pay and benefits you receive?	05	54	-22	-08
21. For the job I do, I feel the amount of money I make is good.	-09	-7	12	-03

Table 1. Factor Structure for Items from the Survey of Organizations

Items	Loadings				
	1	2	3	4	5
1. All in all, how satisfied are you with the persons in your work group?	27	-70	13	07	-01
2. All in all, how satisfied are you with your supervisor?	82	-06	25	16	15
3. All in all, how satisfied are you with your job?	40	-04	50	48	-09
4. All in all, how satisfied are you with the Army compared to most other organizations?	05	20	60	40	11
5. Considering your skills and the effort you put into the work, how satisfied are you with your pay?	10	-17	75	-15	00
6. How satisfied do you feel with the progress you have made in the Army up to now?	23	-08	78	13	07
7. How satisfied do you feel with your chance for getting ahead in the Army?	27	02	76	21	13
8. How friendly and easy to approach is your supervisor?	83	-17	16	03	12
9. When you talk with your supervisor, to what extent does he pay attention to what you're saying?	87	-16	15	07	16
10. To what extent is your supervisor willing to listen to your problems?	83	-15	17	13	25
11. How much does your supervisor encourage people to give their best effort?	71	-28	09	06	81
12. To what extent does your supervisor maintain high standards of performance?	39	-06	11	18	76
13. How friendly and easy to approach are the persons in your work group?	14	-77	-03	-01	30
14. When you talk with the persons in your work group, to what extent do they pay attention to what you're saying?	09	-81	-05	23	07
15. To what extent are persons in your work group willing to listen to your problems?	02	-82	07	25	09
16. How much do persons in your work group encourage each other to give their best effort?	08	-28	13	83	05
17. To what extent do persons in your work group maintain high standards of performance?	14	-33	11	77	23

### Cureton Morale Questionnaire

The Cureton morale questionnaire (Cureton, 1960), utilizing a 5-point Likert-type format, was included because it had been developed on a large military sample (airmen). Based on preliminary analyses, PDI recommended that 43 items be included in the present survey instrument. These 43 items were factor analyzed, and the four-factor rotated solution appeared most interpretable, yielding the factor structure shown in Table 11. Factor 1 appeared to correspond to Cureton's "general morale" scale combined with the "satisfaction with the Army as a whole" scale. Factor 2 seems to reflect Cureton's "satisfaction with management and communication" scale. Here, management refers to broader support rather than immediate supervision. Factor 3 reflects the Cureton "job satisfaction" scale and factor 4 reflects Cureton's "satisfaction with the civilian community" scale. Several of the 43 items did not load particularly strongly on any of these factors and appear to be fragments of the three Cureton scales deleted from the original item set.

Four composites were derived based on this factor structure. "Satisfaction with Army lifestyle" consisted of items 3, 5, 6, 7, 8, 9, 19, 23, 26, 32, 34, 40, and 43 (reversed). "System support" was composed of items 4, 13, 18, 20, 24, 25, 28, 30, 35, and 38. "Attitude toward the job" was composed of items 10, 14, 22, 29, 31, 36, 39, and 41. "Surrounding community" was composed of items 1, 16, and 42. All item numbers are listed in Table 11.

### Prior Expectancies

A series of 24 items asked the men about how various aspects of Army life compared with their expectations upon entering the Army (Borman et al., 1975). Each item was rated on a 7-point scale, ranging from "very much worse than I expected" (-3) to "very much better than I expected" (+3).

Factor analysis of these items yielded a five-factor solution presented in Table 12. Factor 1 accounted for most of the interpretable variance and was labeled as an "opportunities" factor, reflecting the extent to which the individual feels he has the opportunity or freedom to be individuals, and to do the things he feels are worthwhile. All items containing the word "opportunities" load on this factor. Interestingly, items 9 and 10, dealing with personal recognition and responsibility, also load on this factor. Factor 2 was labeled "social life," factor 3 dealt with expectations about coworkers, factor 4 was a pay and promotions factor, and factor 5 involved expectations about the quality of facilities and general living conditions.

Five composite scores were derived reflecting each of these factors. "Opportunities" contained items 5, 7, 9, 10, 13, 14, 16, and 20. "Social life" consisted of items 8 and 18. "Coworkers" was composed of

Table 11. Factor Structure for Cureton Items

Items	Factor Loading			
	1	2	3	4
1. How well do the civilians near your base get along with soldiers?	04	11	-11	<u>74</u>
2. How do you feel about the condition of the tools, equipment, and supplies you use?	30	35	-08	29
3. After you go back to civilian life, what will be your attitude toward the Army?	<u>76</u>	27	-26	16
4. Are you given enough notice and explanation of changes in rules and regulations?	29	49	-18	11
5. Has being in the Army interfered or helped with your plans for the future?	<u>64</u>	11	-33	07
6. Do you feel that you can get ahead faster in the Army or in a civilian job?	<u>76</u>	11	-22	13
7. How secure is your future in the Army compared with what it would be in civilian life?	<u>67</u>	19	-26	08
8. How do you feel about the progress you have made in the Army so far?	<u>51</u>	29	-34	04
9. In general, what kind of people choose the Army as a career?	<u>59</u>	19	-19	14
10. How interesting is your job?	35	24	-67	12
11. How hard do you think the Army is trying to improve its ways of doing things?	43	45	-09	27
12. When I think of all the things I have done to get ahead in life...	07	37	-20	19
13. The Army does all it can to keep its men informed on such things as the world situation, the policy of the United States, etc.	29	<u>56</u>	-09	18
14. The other men in my unit rate my job high in importance	11	27	-58	18
15. How often do you get conflicting orders?	28	41	-17	08

Table 11. Factor Structure for Cureton Items (Cont.)

	Factor Loadings			
	1	2	3	4
16. How do you rate the community nearest to your base as a "soldiers' town?"	13	27	-13	69
17. How do you feel most of the time?	33	45	-21	15
18. Would you receive quick and proper medical treatment if you were injured while on duty?	26	54	-12	26
19. How well are you getting along in the Army?	56	33	-16	01
20. How well are you kept informed about what is going on in the Army?	36	68	-18	13
21. Most civilians think highly of the men in the Army.	13	44	-01	36
22. How much of a future is there in your present PMOS?	29	17	-51	27
23. As a place for a married man to raise a family, the Army is...	57	26	-02	16
24. The methods by which we are informed about the various services and benefits in the Army are very effective.	31	60	-12	19
25. How satisfactory are the provisions for recreation at your present location?	10	53	-25	15
26. Are you generally as happy now as you were before you joined the Army?	70	22	-28	11
27. Compared with what your social standing as a civilian would be, what is your social standing as a soldier?	48	45	-35	-01
28. Do you think the Army provides modern safety equipment for your protection on the jobs where it is needed?	17	43	-27	01
29. How useful do you feel your Army training and experience would be to you in civilian life?	25	20	-66	23



Table 11. Factor Structure for Cureton Items (Cont.)

	<u>Items</u>				<u>Factor Loading</u>			
	1	2	3	4	1	2	3	4
30. How well are Army policies and the reasons for them explained to you?	27	63	-25	21				
31. My present job suits me better than any other job I know of in the Army.	20	22	-64	-01				
32. How much pride do you take in being a member of the Army?	69	25	-21	05				
33. Service with the Army has given me a chance to learn things I think are important.	45	30	-37	-01				
34. When your present tour of duty is up, will you want to reenlist in the Army?	72	09	-22	22				
35. Could you get the full story about any Army policy or practice that affects you by asking for it?	57	57	-18	-01				
36. I get a feeling of pride from the work I am doing now.	39	31	-65	04				
37. How well can you predict what will happen to you if you break a rule?	-17	32	-08	-01				
38. How much does the Army tell the men about new things which may affect their jobs; such things as new equipment, new operating procedures, and the like?	13	60	-32	-04				
39. How does your job match your training and experience?	31	32	-54	-09				
40. In general, I feel that I have gotten a square deal from the Army.	48	26	-34	01				
41. If you were just entering the Army, would you choose the same career field you are in now?	20	07	-69	17				
42. How well do you like being stationed where you are right now?	55	12	-10	43				
43. All in all, how satisfied are you with your <u>life</u> in the Army?	-64	-17	22	-08				

Table 12. Factor Structure for Prior Expectancies

Item	Factor Loadings				
	1	2	3	4	5
1. My working conditions are	.41	.14	.05	.19	.67
2. My immediate superiors are	.45	-.03	.18	-.44	.37
3. My pay is	-.02	.21	.01	-.73	.22
4. My living conditions are	.22	.31	.20	-.33	.49
5. My opportunities for doing worthwhile work are	.63	.15	.10	-.19	.43
6. The Army's policies and practices toward me are	.31	.04	.03	-.34	.62
7. My opportunities for training are	.63	.00	.04	-.24	.36
8. My social life is	.37	.67	-.02	-.04	.30
9. The amount of recognition I get for doing good work is	.57	-.01	-.01	-.39	.40
10. The amount of responsibility I have is	.68	.01	.00	-.29	.24
11. The food I get is	.09	.15	.25	-.17	.60
12. The guys in my unit are	.05	.15	.80	.05	-.02
13. My opportunities for helping others are	.73	.11	.39	-.11	-.05
14. My opportunities for using my abilities fully are	.78	.16	.05	-.07	.35
15. Our equipment and supplies are	.75	.14	-.04	-.03	.73
16. My opportunities for planning my own life are	.49	.38	-.07	-.38	.14
17. My benefits, aside from pay, are	.25	.32	.02	-.62	.11
18. My opportunities for having sexual relations are	-.06	.81	.10	-.16	.11
19. The recreation facilities here are	.25	.35	.07	-.19	.51
20. My opportunities for doing interesting work are	.69	.22	.02	-.12	.37
21. The amount of pressure is	.77	.01	.01	-.49	.43
22. The amount of personal freedom I have is	.38	.14	.05	-.45	.49
23. The race relations here are	.10	-.09	.72	-.15	.27
24. My chances for promotion are	.39	-.07	.13	-.65	.11

items 12 and 23. "Pay/promotions" consisted of items 3, 17, and 24. "Facilities" contained items 1, 4, 6, 11, 15, 19, and 22.

#### Self-Report Behavioral Criteria

Eleven items in the questionnaire were in a form that called for a self-report of some aspect of an activity or behavior. These items were examined as a group through the use of factor analysis for their possible use as self-report criteria of behavior or performance. Results are presented in Table 13. Three interpretable factors emerged in the varimax rotated solution. Factor 1 appears to deal with qualitative aspects of performance--the extent to which the soldier sees himself as effective and performing a worthwhile function. Intention to reenlist is related to this aspect of performance and indicates that soldiers who report their performance to be effective and worthwhile are more likely to reenlist than those who do not see their performance as worth the effort.

Factor 2 appears to be a quantitative aspect of work, reflecting the amount of time spent in excess of what is equitable. These two items were originally described by Patchen (1965). Also loading on this factor is self-reported frequency of AWOLs for the preceding year. Factor 3 deals with rules infractions and frequency of getting into trouble although, interestingly, it does not include AWOLs. The item dealing with sick calls did not load on any of these factors and was treated as a separate criterion item. In addition, reports of AWOLs and intention to reenlist were treated as separate criteria, because they were considered to be important criteria independent of their relationship to other variables. They were not included in the composite scores reflecting the factors on which they loaded in order to minimize artifactual interrelationships among the criteria. "Effort" contained items 8, 9, 10, and 11; "Quantity" consisted of items 6 and 7, as listed in Table 13.

#### Morale

Three self-report measures of morale are reported in this paper. Each respondent rated his own and his unit's morale on a 7-point scale ranging from "extremely high" (7) to "extremely low" (1). A third morale measure was obtained by summing these two items. The mean for "own morale" ratings was 2.69, with S.D. = 1.67; unit morale mean = 2.18, with S.D. = 1.32. The summed morale mean was 4.87, with S.D. = 2.63. The men consistently indicated a belief that the overall morale of the men was somewhat lower than their own morale, and, in general, reported morale was very low indeed, with mean morale falling substantially below the scale point mean of 4. Interestingly, the morale ratings of the men did not always agree with the headquarters staff ratings of morale. Although the two units with highest morale as rated by the men were

also judged by headquarters to have the highest morale, four of the remaining six units were misclassified. Two units judged to have low morale in fact had moderate morale, and two units judged by headquarters to have moderate morale were actually low on morale.

Table 13

Factor Structure for Self-Reported Behavioral Criteria

Item	Factor loadings		
	I	II	III
1. Self-report of AWOLs in past year	-05	<u>-51</u>	16
2. Self-report: Article 15s in past year	-17	-02	<u>80</u>
3. Self-report: Number of busts in past year	12	-05	<u>78</u>
4. Self-report: Sick calls in past month	-17	03	11
5. Do you think you will reenlist? (Annotated)	<u>-52</u>	-13	02
6. Do you work harder, less hard, or the same as others doing your type work?	-13	<u>-76</u>	-01
7. How often do you do extra work for your job which isn't really required?	-04	<u>-78</u>	-12
8. Amount of effort you put into your work	<u>77</u>	27	08
9. Your performance on your job (low to high)	<u>78</u>	08	09
10. Is it worthwhile to be an outstanding soldier?	<u>75</u>	05	-08
11. How effective are you as a soldier?	<u>78</u>	-03	-04

Summary

As a result of the procedures described in this section, a number of self-report measures of motivation, morale, and satisfaction with various aspects of the job situation have been developed. Most of these measures are identical to or are slight modifications of existing measures that have been developed and validated in nonmilitary populations

and that have been used with some success to diagnose organizational problems in industrial populations. As such, they represent a useful set of potential criteria in subsequent phases of the research program. In addition, they constitute a set of variables against which the subset of diagnostic items for the WEQ can be evaluated, in both a concurrent as well as a predictive sense. That evaluation is the concern of the next section of this report.

#### VALIDATION OF THE PILOT SET OF DIAGNOSTIC ITEMS

The present survey relied upon self-reports of various criteria as well as for their predictors. This situation, in which predictors and criteria came from the same source, raises the issue of what constitutes a predictor or independent variable (IV) and what constitutes a dependent variable (DV). Some obvious distinctions exist in the research literature, but they often fail to adequately distinguish the status of the two variables. Furthermore, some variables are treated as DVs in some contexts and as IVs in other situations. A well-defined, specific group product or output usually clearly qualifies as a dependent variable. Certain forms of generalized behavior are usually treated as DVs, such as effort or amount of work, while more specific types of behavior such as leader style are most often treated as IVs. In a similar fashion, although there is a lot of crossing over the line of distinction, global measures of satisfaction and morale are usually treated as DVs, while more specific measures, such as satisfaction with coworkers or pay, can be considered as either DVs or IVs. This distinction can also be observed in the development of self-report surveys. The WEQ as originally developed (Turney & Cohen, 1976) was specifically designed to be an organizational diagnostic instrument and thus focuses upon a number of very specific aspects of the work environment. Virtually all of the elements of the WEQ can be and have been treated as IVs in statistical analyses.

The distinction between criteria and antecedents in this study is based upon the following considerations. Global measures of satisfaction and morale are treated as criteria. Behaviors and behavioral intentions that are usually treated as indicators of satisfaction or performance are treated as criteria. Measures of specific aspects of the work environment, especially when they can be reasonably assumed to precede or partially cause the variables chosen as criteria, are treated as antecedents or independent variables.

Evaluation of the pilot diagnostic instrument will take two forms. First, two higher order factor analyses were performed to examine all variables within a broad overall context and to determine whether any validity of a concurrent nature could be demonstrated for the pilot instrument items. Second, a number of multiple regressions were performed to determine how much predictive power was available in this preliminary survey instrument.

### Higher Order Factor Analyses

Second level analyses were performed in an effort to obtain a broader view of the entire system within which the respondents found themselves. Even though the first order factor analyses might accurately and meaningfully describe the underlying structure of the items of the various subsets of scales, they do not provide information as to the relative importance of these isolated structures in a system in which many sources of variation are present. This point is of particular practical importance in planning and implementing any intervention program, since failure to observe the overall system might result in overemphasis on a relatively unimportant problem area while completely missing a more important one. Once the broader areas of difficulty are identified through a broadly conceived analysis of system variation, then the first order factor analyses can be used for developing the more specific strategies and interventions to be used to ameliorate the problem area.

As presented in Table 14, the analysis of 43 predictor composite scores, derived from the factor analysis described in the previous chapter, yielded an interpretable 9-factor solution. The first factor reflects the extent to which the soldiers have found their pre-Army expectations regarding their quality and style of life to be satisfied. This factor is epitomized by the item measuring expectancies regarding social life, but also includes items dealing with system support and Army policies as well as the surrounding community. Factor 2 is a perceived job importance factor, and all of the WEQ job importance items load together on this factor, to the exclusion of all other composites. The highest loading item was the perceived importance of the job to all higher headquarters. Factor 3 is clearly a coworker factor, defined by the three WEQ coworker composites, the JDI coworker satisfaction scale, and the 2 SOO peer related composites. The highest loading item was the WEQ overall group climate composite.

Factor 4 reflects a general attitude toward living in Germany and contains only those items dealing with this topic. Interestingly, the "surrounding community" composite does not load on this factor, but rather on the "quality of Army life" factor, suggesting that the men are not using the surrounding German community as a reference for these items, but that they are thinking of the American community. Factor 5 is an overall supervision factor incorporating virtually all of the supervision composites, including the three WEQ composites, the two SOO supervision items, the expectancies about superiors' composite, and the JDI supervision scale. The close relationship between quality of supervision and perception about various aspects of the work situation is reflected in the presence of this factor of a number of items with somewhat lower loadings (.4 to .6) that deal with job autonomy and responsibility and perceptions of the work and facilities. The highest loading item on this factor is the WEQ overall supervision composite.

Table 14

Items With Loading Greater Than .4 From the 9-Factor  
Solution of Predictor Composite Scores

Source	Loading
FACTOR I. Quality of life	
1. Expectancies regarding social life	78
2. Expectancies regarding opportunities	49
3. Expectancies regarding pay and promotions	46
4. Expectancies regarding facilities	57
5. Expectancies regarding job pressure	47
6. Surrounding community	-59
7. System support and Army policies	-53
FACTOR II. Job Importance	
1. To self	55
2. To supervisor	77
3. To self and supervisor	75
4. To battery headquarters	87
5. To all higher headquarters	87
FACTOR III. Coworkers	
1. WEQ-Group cohesion	-76
2. WEQ-Group performance norms	-66
3. WEQ-Overall group climate	-86
4. JDI-Coworkers	-64
5. SOO-Peer support	-61
6. SOO-Peer goal emphasis	-64
FACTOR IV. Living in Germany	
1. Liking for German life style	74
2. Coping in Germany	80
3. General Germany related items	98

Table 14 (Continued)

Source	Loading
FACTOR V. Supervision	
1. WEQ-Initiation of structure	-80
2. WEQ-Consideration	-84
3. WEQ-Overall supervision	-87
4. Expectancies regarding opportunities	-52
5. Expectancies regarding facilities	-40
6. Expectancies regarding superiors	-59
7. SOO-Supervisory support	-79
8. SOO-Supervisory goal emphasis	-67
9. WEQ-Job responsibility	-59
10. WEQ-Job autonomy	-53
11. WEQ-On the job training	-44
12. Cureton: Attitudes toward the job	44
13. JDI-Work	-48
14. JDI-Supervision	-77
FACTOR VI. Job involvement	
1. WEQ-Job keeps me busy	-71
2. WEQ-Importance of job to self	-48
FACTOR VII. Hostility and Boredom	
1. WEQ-"hard-nose" attitude	63
2. WEQ-Attitude of officers and boredom	68
3. WEQ-Hostility boredom and isolation	74
FACTOR VIII. Pay and Promotions	
1. Expectancies regarding pay and promotion	-61
2. JDI-Pay	-70
3. JDI-Promotions	-61
FACTOR IX. Alienation	
1. Expectancies regarding coworkers	-46
2. Alienation	62



Factor 6, "job involvement," contains two items loading above .4: the importance of the job to oneself (.48) and the extent to which the job keeps the respondent busy (.71). Both items are from the original WEQ item pool. Factor 7 appears to reflect a general hostility-boredom syndrome with strong overtones involving perceived attitudes of officers and NCOs toward the enlisted men.

Factor 8 reflects satisfaction with pay and promotions, involving the JDI pay and promotions scales, as well as the single expectancy composite regarding pay and promotions. Factor 9 appears to be a general alienation factor, distinct from the hostility factor, and reflects some disappointment in the caliber of coworkers.

Two items did not attain a loading of .4 or higher on any factor. Those were off-duty formal training and group norms from the "job itself" section of the WEQ.

In a second analysis, 17 criterion scores were entered into a principal axis factor analysis with varimax rotations. The six-factor solution was selected as most meaningfully reflecting the item space. Factor loadings are presented in Table 15. The first three factors involve the various satisfaction measures, and because the various measures tend to tap the same general feeling of satisfaction there is a fair amount of cross-loading of these measures on more than one factor. The interesting aspect of this finding is that the satisfaction measures do not all load together on a single factor. Furthermore, each of the three factors is uniquely defined by at least one other criterion item not typically treated as a direct measure of satisfaction. Two of these factors involve items dealing with a reported behavior or behavioral intention.

Factor 1 was labeled "satisfaction" and is defined primarily by the MSQ measure of satisfaction, the SOO measure of satisfaction, and reported morale. Factor 2 is a reenlistment intention factor but also is defined by the Cureton satisfaction with Army life composite. Factor 3 picks up some of the MSQ and SOO items, but is primarily defined by the Brayfield-Rothe measures. This is a puzzling factor, since it is also a "satisfaction" factor but suggests that the Brayfield-Rothe measure and the MSQ are not tapping the same construct. It may well be that Smith et al. (1969) are correct in assuming that job satisfaction is not a unitary construct. In addition, this factor is associated with reported effort or quality of job performance.

Factor 4 involved reported AWOLs and amount of hours worked. A possible implication is that the greater the number of hours a man is required to work, the greater the likelihood that he will go AWOL. Factor 5 contains a single item, reported frequency of going on sick call. Factor 6 also contains a single item, reported rules infractions.

From this factor structure a final set of 12 criteria was selected for further analysis. Since some factors involved both perceptual and behavioral items, more than one item was selected from some factors.

Table 15. Factor Structure of Criterion Scores

ITEMS	Factor Loadings					
	I	II	III	IV	V	VI
1. MSQ- Overall Satisfaction	<u>82</u>	-12	44	02	-06	11
2. MSQ- Intrinsic Items	<u>12</u>	-15	<u>52</u>	00	-06	08
3. MSQ- Extrinsic Items	<u>86</u>	-09	22	07	-01	19
4. B-R- Overall Satisfaction	-32	20	<u>-89</u>	-01	-03	04
5. B-R- Positively worded items	-35	17	<u>-68</u>	-10	11	00
6. B-R- Negatively worded items	-17	17	<u>-78</u>	08	-15	07
7. SOO- Overall Satisfaction	<u>64</u>	-33	48	02	-05	15
8. Cureton- Satisfaction with Army life	-42	<u>71</u>	-38	07	-01	-10
9. Cureton- Reenlistment	-15	<u>88</u>	-22	03	-04	-05
10. Quantity of Performance	16	11	-23	<u>65</u>	19	09
11. Quality of Effort in Work	16	-33	<u>53</u>	-25	-19	04
12. Own Morale	<u>56</u>	-41	26	-03	07	-12
13. Unit Morale	<u>72</u>	-21	-03	-03	-03	-31
14. Rules infractions	-05	01	04	03	02	<u>-92</u>
15. AWOL	-08	03	13	<u>84</u>	-17	-09
16. Sick Call	-08	-01	01	-01	<u>95</u>	-02
17. WFEQ- Annotated Reenlistment	-13	<u>87</u>	-14	08	05	01

Several satisfaction/morale items were chosen because of the unusual situation where satisfaction items were loading on two different factors, and because there is some belief in the Army that "morale" is conceptually more than simply satisfaction. The four satisfaction composites (MSQ, SOO, Brayfield-Rothe, and Cureton) along with own and unit morale were included to represent the perceptual side of the criterion set. Reenlistment, quantity and quality of performance, AWOL, sick call, and rules infractions were included to represent the behavioral criterion set. These criteria were then used to assess the predictive validity of the diagnostic portion of the instrument.

### Predicting the Criteria

Unit-weight composite scores for each of the nine factors representing various facets of the overall organizational system were formed using the items listed in Table 14. These nine scores were then entered into a series of step-wise multiple-regression analyses to determine their efficacy in predicting each of the 12 criteria selected from the analysis reported in Table 15. In all analyses two criteria were used for stopping the step-wise insertion of variables. First, the F ratio associated with the inserted variable must exceed the .01 level of significance; second, the newly inserted variable must result in at least a .02 change in  $R^2$ . These analyses are summarized in Table 16.

None of the nine independent variables was able to successfully predict any meaningful amount of variance in self-reported sick calls and AWOL rate. Reported rules infractions are predicted by "pay and promotions," but with  $R = .214$ , the total accountable variance is extremely small. Respondents reported only .09 instances of AWOL per person, .36 instances of rules infractions per person, and .43 sick calls per person. Furthermore, as self-reports these criteria are prone to be highly unreliable. The quantity of work criterion also provided only a small amount of variance accounted for by the single dimension of job involvement.

The rest of the criteria follow two general patterns of predictability: those in which the supervision factor enters first and those in which quality of life enters first. These two dimensions are clearly the most important predictors of most of our criteria. Three of the satisfaction measures--the SOO, MSQ, and Brayfield-Rothe scales--are most strongly associated with the supervision dimension. Furthermore, a very important behavioral criterion, quality of work effort, is also strongly predicted by supervision. Quality of life is the primary predictor of own and unit morale, the Cureton satisfaction with Army life scale, and intention to reenlist. Furthermore, this is the secondary dimension in predicting the SOO and MSQ measures of satisfaction.

These analyses provide rather strong evidence for the conclusion that only two general dimensions account for substantial amounts of variance for important behavioral and perceptual criteria. Of course,

Table 16. Step-wise Multiple Regressions on Twelve Criteria by Nine Independent Variables.

CRITERIA	PREDICTORS	Beta	R
1. Sick calls	none	---	----
2. AWOLs	none	---	----
3. Rules Infractions	1. Pay & Promotions	-.214	.214
4. Unit Morale	1. Quality of Life	.566	.566
5. Own Morale	1. Quality of Life	.656	.656
6. Quality (effort)	1. Supervision 2. Job Involvement	.392 .187	.500
7. Quantity of Work	1. Job Involvement	-.233	.233
8. Intention to Reenlist	1. Quality of Life	-.514	.514
9. Careton: Satisfaction with Army Life	1. Quality of Life 2. Pay & Promotions	-.589 -.250	.765
10. SOO: Satisfaction	1. Supervision 2. Quality of Life	.454 .400	.807
11. B-R: Satisfaction	1. Supervision	-.556	.556
12. MSQ: Satisfaction	1. Supervision 2. Quality of Life	.529 .351	.815

each of the two primary dimensions is composed of a number of subfacets that reflect various aspects of the general dimension.

#### DISCUSSION

The findings presented in this report are the results of an initial attempt to introduce a pilot diagnostic instrument into a combat arms organization within the U.S. Army. The instrument was derived in part from a subset of items extracted from the Work Environment Questionnaire (Turney & Cohen, 1976), which was originally developed and validated in a noncombat support organization. The present instrument has shown a significant capacity to effectively predict meaningful amounts of variance in a number of self-report criterion measures of satisfaction, perceptions, and behavioral intentions. Most of these criteria had been previously developed and validated in industrial settings, where they are still being used.

Results of the present research provide a great deal of useful information regarding the developmental philosophy and validation procedures originally used for the WEQ (Turney & Cohen, 1976) as well as providing an initial information base for developing and introducing the WEQ into a completely new organization. For example, since the WEQ was specifically developed as a diagnostic instrument to be used in conjunction with planned organizational intervention research programs, it purposely does not tap system variables that may affect satisfaction and motivation unless those variables are potentially amenable to OD-type interventions. The possible existence of unchangeable organizational variables is a problem in many OD research programs and has led to a concern over the extent to which OD interventions are attacking meaningful or important problem areas in an organization. The present survey instrument therefore included an expanded set of items dealing with some of these system variables.

Factor analysis results suggest that there are two primary dimensions which accounted for a large portion of the item variance: quality of life and supervision. Variables loading on the first dimension are essentially not amenable to OD interventions, and most of the items, such as pay and facilities, are not even under the direct control of the immediate organization, but are usually under the control of even higher headquarters. The other primary dimension, supervision, however, contains variables typically included in OD programs and represents a primary focus of the WEQ diagnostic topics. Not only does the WEQ sample a major motivational dimension within organizations, but it does so within the constraints of the purpose for which it was developed: to diagnose organizational problems amenable to amelioration through OD intervention techniques.

Furthermore, the data from the multiple regression analyses provide support for this procedure. Although both the quality of life and supervision dimensions are significantly related to criterion measures,

it is apparent that supervision factors are an important source of variance. In other words, variables that are amenable to change and that are the focus of the WEQ are also shown to be important problem areas that can have far-reaching impact on satisfaction and motivation. Furthermore, supervision is the primary determinant of job satisfaction and on-the-job behavior (i.e., effort), suggesting that criteria for an OD program should focus on job-related behaviors in contrast to other indicators of satisfaction, such as turnover. This focus on job context variables is, of course, precisely the focus that has characterized the original intervention program (Turney, 1975).

Also included in the survey were a number of previously developed measures of motivation and satisfaction. Factor analysis results showed a gratifying amount of convergent validity, with conceptually similar measures typically loading together with the corresponding WEQ measures. Furthermore, the WEQ measure of an organizational characteristic typically was the highest loading item on its factor, thus providing support for the developmental philosophy of tailoring an instrument to the organization it is to measure.

An attempt to reduce the length of the original WEQ item sets defining specific organizational variables in an effort to shorten the overall length of the questionnaire may have resulted in a reduction in the ability of the present instrument to distinguish between some usually distinct characteristics. For example, the supervisory initiation of structure and consideration behavioral dimensions collapsed into a single supervision factor in this survey. This finding thus provides another confirmation of the original development of the WEQ and indicates the necessity of retaining the original subscales as intact as possible when the WEQ is introduced into the present organization.

In conclusion, the data in this report provided substantial confirmation of the philosophical and procedural underpinnings of the WEQ. Furthermore, these data provided an information base which helped guide the introduction of the WEQ into the organization as well as the subsequent intervention program.

# REFERENCES

- Borman, W. C., Johnson, P. D., Motowidlo, S. J., & Dunnette, M. D. Measuring motivation, morale, and job satisfaction in Army careers. Final report, Contract DAHCl9-73-C-0025 with the Army Research Institute, Alexandria, Va., 1975.
- Bowers, D. G. OD techniques and their results in 23 organizations: The Michigan ICL Study. Journal of Applied Behavioral Science, 1973, 9, 24-43.
- Cureton, E. E. Dimensions of airmen morale. (Technical Note WADD-TN-60-137) Lackland Air Force Base, Tex.: Personnel Laboratory, Wright Air Development Division, 1960.
- Friedlander, F., & Brown, L. D. Organization development. Annual Review of Psychology, 1974, 25, 313-341.
- Hackman, J. R., & Oldham, G. R. Development of the job diagnostic survey. Journal of Applied Psychology, 1975, 60, 159-170.
- Motowidlo, S. J., Dowell, B. E., Hoppe, M. A., Borman, W. C., Johnson, P. D., & Dunnette, M. D. Motivation, satisfaction, and morale in Army careers: a review of theory and measurement. ARI Technical Report TR-76-A7, December 1976 (AD A836 373).
- Patchen, M. Some questionnaire measures of employee motivation and morale. Ann Arbor Survey Research Center, Institute for Social Research, University of Michigan, 1965.
- Smith, F. J. Problems and trends in the operational use of employee attitude measurement. Paper presented at the American Psychological Association Convention as part of a symposium, 1962.
- Smith, P. C., Kendall, L. M., & Hulin, C. L. Measurement of satisfaction in work and retirement. New York: Rand-McNally, 1969.
- Taylor, J. C. & Bowers, D. G. Survey of organizations. Ann Arbor: Institute for Social Research, University of Michigan, 1972.
- Turney, J. R. Utilization of behavioral measures of effort in an OD program. Symposium paper presented at 83rd annual meeting of APA, Chicago, 1975.
- Turney, J. R., & Cohen, S. L. The development of a Work Environment Questionnaire for the identification of organizational problem areas in specific Army work settings. ARI Technical Paper 275, June 1976.
- Weiss, D. J., Dawis, R. V., England, G. W., & Lofquist, L. H. Manual for the Minnesota Satisfaction Questionnaire. Minnesota Studies in Vocational Rehabilitation, Whole No. 22, 1967.